APPENDIX G

FIRE CONTROL AND DISTRIBUTION TECHNIQUES

Suppressing or destroying the enemy with direct fires is fundamental to success in close combat. Effective direct fires are essential to winning the close fight. Because fire and movement are complementary components of maneuver, the BFV platoon leader must be able to effectively mass the fires of all available resources at critical points and times to be successful on the battlefield. Effective and efficient direct fire control means that the platoon acquires the enemy rapidly and masses the effects of direct fires to achieve decisive results in the close fight.

Section I. PRINCIPLES OF DIRECT FIRE CONTROL

Effective direct fire control requires a unit to rapidly acquire the enemy, mass effects of fires, and achieve decisive results in the close fight. When planning and executing direct fires, the platoon leader and subordinate leaders must know how to apply several fundamental principles. The purpose of these principles of direct fire is not to restrict the actions of subordinates. Applied correctly, these principles help the platoon to accomplish its primary goal in any direct fire engagement, to both acquire first and shoot first, and to give subordinates the freedom to act quickly upon acquisition of the enemy. The principles of direct fire control are:

- Mass the effects of fire.
- Destroy the greatest threat first.
- Avoid target overkill.
- Employ the best weapon for the target.
- Minimize friendly exposure.
- Prevent fratricide.
- Plan for extreme limited visibility conditions.
- Develop contingencies for diminished capabilities.

G-1. MASS THE EFFECTS OF FIRE

The platoon must mass the effects of its fires to achieve decisive results. Massing entails focusing fires at critical points, distributing the effects, and shifting to new critical points as they appear. Random application of fires is unlikely to have a decisive effect. For example, concentrating the platoon's fires at a single target may ensure its destruction or suppression; however, this probably will not achieve a decisive effect on the enemy formation, personnel, or position.

G-2. DESTROY THE GREATEST THREAT FIRST

The platoon engages targets in direct relation to the danger they present. If two or more targets of equal threat present themselves, then the platoon engages the closest target first. The platoon marks the defense engagement area so it can determine when to engage various targets and plan these ranges on their sketches and range cards. For example, the platoon should mark the engagement area at the Javelin maximum engagement distance (2,000 meters) to ensure that gunners do not waste missiles. Also, the platoon should

mark the BMP danger area of 1,000 meters to determine when BMPs pose a viable threat.

G-3. AVOID TARGET OVERKILL

The platoon strives to avoid engaging a target with more than one weapon system at a time. To avoid target overkill, the platoon can divide engagement areas into sectors of fire or quadrants to better distribute direct fire among the platoon.

a. The platoon can use many techniques to mark the engagement area. The platoon and company should develop an SOP for dividing the engagement area with both infrared and thermal target reference points so that all elements can distribute fires within the engagement area.

b. Squads and platoons should mark the engagement areas with infrared devices for engagements during limited visibility. The engagement area should also be marked with thermal devices. For example, the platoon can use a mixture of rocks, sand, and diesel fuel inside a fuel drum, ammunition can, or bucket that has burned shortly before dusk to give off a heat source for most of the night.

c. The platoon leader may also designate rates of fire, by weapon system, to avoid target overkill. Predetermining the rates of fire allows the platoon leader to plan for sufficient ammunition for a desired effect on the enemy. The rates of fire are cyclic, rapid, and sustained.

G-4. EMPLOY THE BEST WEAPON FOR THE TARGET

Using the appropriate weapon for the target increases the probability of rapid enemy destruction or suppression. It also conserves ammunition.

a. Target type, range, and exposure are key factors in determining the weapon that should be employed as well as the desired target effects. The platoon leader task-organizes and arrays his forces based on the terrain, enemy, and desired effects of fires.

b. The platoon leaders, squad leaders, and BCs must ensure that they focus the fires of their weapons systems on the targets they should be engaging. For example, the Javelin is used against armored targets at ranges of 2,000 meters for stand-off protection, whereas the M240B machinegun is used to destroy unarmored vehicles and enemy infantry at ranges within 1,000 meters.

G-5. MINIMIZE FRIENDLY EXPOSURE

Units increase their survivability by exposing themselves to the enemy only to the extent necessary to engage him effectively. Natural or manmade defilade provides the best cover. Crews and squads minimize their exposure by constantly seeking effective available cover, attempting to engage the enemy from the flank, remaining dispersed, firing from multiple positions, and limiting engagement times.

G-6. PREVENT FRATRICIDE

The platoon leader must be proactive in reducing the risk of fratricide, especially when it concerns his three rifle squads on the mechanized battle field. He has numerous tools to assist him in the prevention of fratricide. (For a detailed discussion of fratricide avoidance refer to Appendix D).

a. The platoon can use infrared and thermal marking techniques to ensure that adjacent units do not mistakenly fire at friendly forces during limited visibility. The assault element can use the infrared codable Phoenix, infrared chemical lights, blacklight tube lights tied to poles, and many other methods to mark the assault element's progress. The platoon leader must ensure that the enemy does not have night vision capability before marking his soldiers' progress with infrared marking devices.

b. By monitoring the unit locations, the leaders at all levels can ensure that they know the precise locations of their own and other elements and can control their fires accordingly. The platoon leader and the platoon sergeant must know the location of each of the squads.

G-7. PLAN FOR EXTREME LIMITED VISIBILITY CONDITIONS

The BFV is equipped (ISU or IBAS) to engage the enemy during limited visibility at nearly the same ranges that are applicable during the day. Soldiers are equipped with limited visibility equipment that enables them to also engage the enemy during limited visibility at the same ranges that are applicable during the day. However, dense fog, heavy smoke, and blowing sand may significantly reduce the platoon leader's ability to control the direct fires of the platoon if he has not taken those into consideration.

G-8. DEVELOP CONTINGENCIES FOR DIMINISHED CAPABILITIES

A platoon leader usually develops a plan based on having all of his assets available, and makes alternate plans to account for the loss of equipment or soldiers. The platoon leader should develop a plan that maximizes his unit's capabilities while still addressing the most probable occurrence. He should then factor in redundancy within the platoon. For example, he may designate alternate sectors of fire for "A" section that provides him the means of shifting fires if "B" section has been rendered incapable. These contingencies may become items within a unit SOP.

Section II. DIRECT FIRE CONTROL

Acquiring and destroying the enemy is a precursor to direct fire engagement with a vehicle, antiarmor weapon, machinegun, or individual weapon. Leaders must not assume that the unit will be able to see the enemy; they must expect the enemy to use cover and concealed routes effectively when attacking and to make best use of flanking and concealed positions in the defense. Therefore, the platoon must practice innovative techniques of direct fire control and distribution in offensive and defensive operations, especially since the enemy may not have an established or well-known order of battle. This is often the case when conducting stability operations.

G-9. FIRE CONTROL PROCESS

To bring direct fires against an enemy force successfully, leaders must continuously apply the four steps of the fire control process (For a detailed discussion of the fire control process refer to FM 71-1). At the heart of this process are two critical actions: rapid, accurate target acquisition and the massing of fires to achieve decisive effects on the enemy. Target acquisition is the detection, identification, and location of a target in sufficient detail to permit the effective employment of all of the platoons weapons.

Massing entails focusing direct fires at critical points and then distributing the fires for optimum effect. The four steps are:

- Identify probable enemy locations and determine the enemy scheme of maneuver.
- Determine where and how to mass (**focus** and **distribute**) direct fires effects.
- Orient forces to speed target acquisition.
- **Shift** direct fires to refocus or redistribute their effects.

G-10. FIRE CONTROL MEASURES

Fire control measures are the means by which the platoon leader or subordinate leaders control fires. Application of these concepts, procedures, and techniques assists the unit in acquiring the enemy, focusing fires on him, distributing the effects of the fires, effectively shifting fires, and preventing fratricide. At the same time, no single measure is sufficient to effectively control fires. At the platoon level, fire control measures will be effective only if the entire unit has a common understanding of what the fire control measures mean and how to employ them. The following discussion focuses on the various fire control measures employed by the platoon. Table G-1 lists the control measures by whether they are terrain- or threat-based.

TERRAIN-BASED FIRE CONTROL MEASURES	THREAT-BASED FIRE CONTROL MEASURES
Target reference point (TRP)	Fire patterns
Engagement area	Target array
Sector of fire	Engagement priorities
Direction of fire	Trigger
Terrain-based quadrant	Weapons control status
Friendly-based quadrant	Rules of engagement (ROE)
Maximum engagement line (MEL)	Weapons safety posture
Restrictive fire line (RFL)	Engagement techniques
Final protective line (FPL)	

Table G-1. Common fire control measures.

a. **Target Reference Point**. A target reference point (TRP) (Figure G-1) is a recognizable point on the ground that leaders use to orient friendly forces and to focus and control direct fires. In addition, when TRPs are designated as indirect fire targets, they can be used in calling for and adjusting indirect fires. Leaders designate TRPs at probable enemy locations and along likely avenues of approach. These points can be natural or manmade. A TRP can be an established site, such as a hill or a building, or an impromptu feature designated as a TRP on the spot, like a burning enemy vehicle or smoke generated by an artillery round. Friendly units can also construct markers to serve as TRPs. Ideally, TRPs should be visible in three observation modes (unaided, passive IR, and thermal) so they can be seen by all forces. TRPs include the following features and objects:

- Prominent hill mass.
- Distinctive building.
- Observable enemy position.
- Destroyed vehicle.

- Ground-burst illumination.
- Smoke round.
- Laser point.

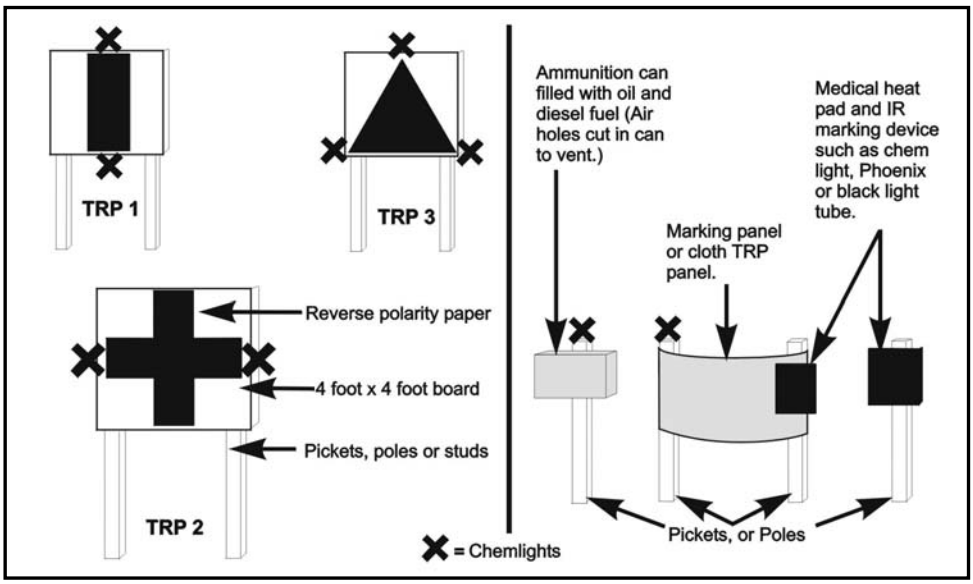

Figure G-1. Example of constructed TRP markers.

b. **Engagement Area**. This fire control measure is an area along an enemy avenue of approach where the platoon leader intends to mass the fires of available weapons to destroy an enemy force. The size and shape of the engagement area are determined by the degree of relatively unobstructed visibility available to the unit's weapon systems in their firing positions and by the maximum range of those weapons. Typically, commanders delineate responsibility within the engagement area (EA) by assigning each platoon a sector of fire or direction of fire; these fire control measures are covered in the following paragraphs.

c. **Sector of Fire**. A sector of fire is a defined area that must be covered by direct fire. Leaders assign sectors of fire to subordinate elements, crew-served weapons, and individual soldiers to ensure coverage of an area of responsibility. They may also limit the sector of fire of an element or weapon to prevent accidental engagement of an adjacent unit. In assigning sectors of fire, platoon leaders and subordinate leaders consider the number and type of weapons available. In addition, they must consider acquisition system type and field of view in determining the width of a sector of fire. For example, while unaided vision has a wide field of view, its ability to detect and identify targets at extended ranges and in limited visibility conditions is restricted. Conversely, most fire control acquisition systems have greater detection and identification ranges than the unaided eye, but their field of view is narrow. Means of designating sectors of fire include the following:

- TRPs.
- Clock direction.
- Terrain-based quadrants.
- Friendly-based quadrants.

d. **Direction of Fire**. A direction of fire is an orientation or point used to assign responsibility for a particular area on the battlefield that must be covered by direct fire. Leaders designate directions of fire for the purpose of acquisition or engagement by subordinate elements, crew-served weapons, or individual soldiers. Leaders most commonly employ direction of fire when assigning sectors of fire because of limited time or insufficient reference points. Means of designating a direction of fire include the following:

- Closest TRP.
- Clock direction.
- Cardinal direction.
- Tracer on target.
- IR laser pointer.

e. **Maximum Engagement Line**. An MEL is the linear depiction of the farthest limit of effective fire for a weapon or unit. The weapon's maximum effective range, the target description, and the effects of terrain determine this line. For example, slope, vegetation, structures, and other features provide cover and concealment that may prevent the weapon from engaging out to the maximum effective range. An MEL serves several purposes for the platoon leader:

- To prevent squads or BFVs from engaging targets beyond the maximum effective ranges of their weapon systems.
- To establish criteria for triggers.
- To depict the maximum extent of the unit's battle space.

f. **Restrictive Fire Line**. An RFL is a linear fire control measure beyond which engagement is prohibited without coordination. In the offense, the platoon leader may designate an RFL to prevent a base of fire element from firing into the area where an assaulting element is maneuvering. This technique is particularly important when BFVs directly support the maneuver of infantry squads. In the defense, the platoon leader may establish an RFL to prevent the unit from engaging a friendly rifle squad positioned in restricted terrain on the flank of an avenue of approach.

g. **Final Protective Line**. The FPL is a line of fire established where an enemy assault is to be checked by the interlocking fires of all available weapons. The unit reinforces this line with protective obstacles and an FPF whenever possible. Initiation of the FPF is the signal for elements, crews, and individual soldiers to shift fires to their assigned portion of the FPL.

G-11. THREAT-BASED FIRE CONTROL MEASURES

The platoon leader uses threat-based fire control measures to focus and control fires by directing the unit to engage a specific, templated enemy element rather than to fire on a point or area. Threat-based fire control measures may be difficult to employ against an asymmetric threat. The following paragraphs describe the TTP associated with this type of control measure.

a. **Fire Patterns**. Fire patterns are a threat-based measure designed to distribute the fires of a unit simultaneously among multiple, similar targets. Platoons most often use them to distribute fires across an enemy formation. Leaders designate and adjust fire patterns based on terrain and the anticipated enemy formation. The basic fire patterns (Figure G-2) are frontal fire, cross fire, and depth fire.

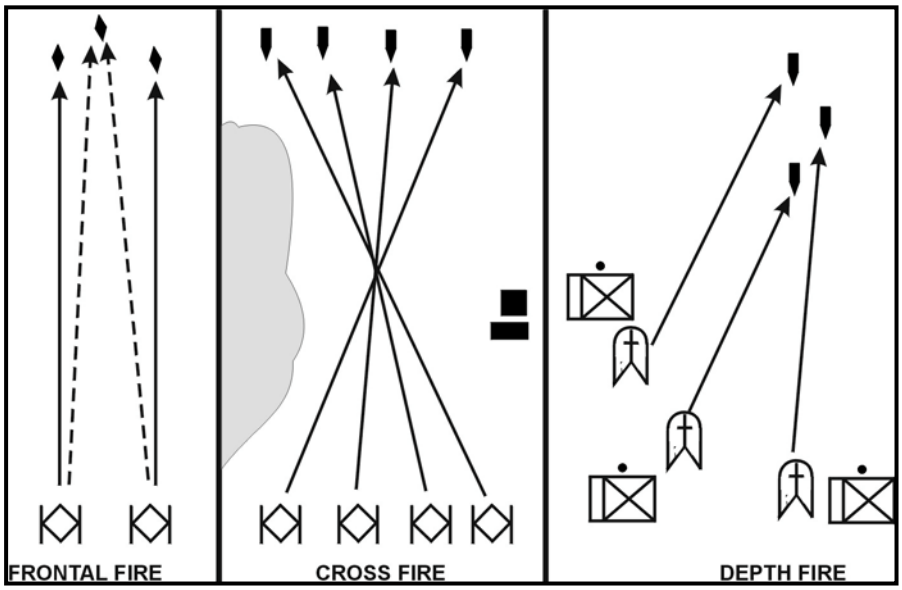

Figure G-2. Fire patterns.

(1) ***Frontal Fire***. Leaders may initiate frontal fire when targets are arrayed in front of the unit in a lateral configuration. Weapon systems engage targets to their respective fronts. For example, the left flank weapon engages the left-most target; the right flank weapon engages the right-most target. As they destroy enemy targets, weapons shift fires toward the center of the enemy formation and from near to far.

(2) ***Cross Fire***. Leaders initiate cross fire when targets are arrayed laterally across the unit's front in a manner that permits diagonal fires at the enemy's flank or when obstructions prevent unit weapons from firing frontally. Right flank weapons engage the left-most targets; left flank weapons engage the right-most targets. Firing diagonally across an engagement area provides more flank shots, thus increasing the chance of kills. It also reduces the possibility that friendly elements will be detected if the enemy continues to move forward. As they destroy enemy targets, weapons shift fires toward the center of the enemy formation.

(3) ***Depth Fire***. Leaders initiate depth fire when targets are dispersed in depth, perpendicular to the unit. Center weapons engage the closest targets; flank weapons engage deeper targets. As they destroy targets, weapons shift fires toward the center of the enemy formation.

b. **Engagement Priorities**. In concert with his concept of the operation, the company commander determines which target types provide the greatest payoff or present the greatest threat to his force. He then establishes these as a unit engagement priority. The platoon leader refines these priorities within his unit.

(1) ***Employ the Best Weapons for the Target***. Establishing engagement priorities for specific friendly systems increases the effectiveness with which the unit employs its weapons. As an example, the engagement priority for the BFVs could be enemy personnel carriers (PCs) then dismounted troops.

(2) ***Distribute the Unit's Fires***. Establishing different priorities for similar friendly systems helps to prevent overkill and achieve effective distribution of fires. For example, if the commander establishes that Javelins will engage all armored vehicles, the platoon leader may designate the enemy's tanks as the initial priority for one Javelin pair while making the enemy's PCs the priority for the BFV sections.

c. **Weapons Ready Posture**. The weapons ready posture is a means by which leaders use an understanding of the factors of METT-TC to specify the ammunition and range for the engagement. Range selection is dependent on the anticipated engagement range. Terrain visibility, weather, and light conditions affect range selection.

(1) Within the platoon, weapons ready posture affects the types and quantities of ammunition carried by rifle squads and vehicles.

(2) For infantry rifle squads, weapons ready posture is the selected ammunition and indexed range for individual and crew-served weapons. For example, an M203 grenadier whose most likely engagement is to cover dead space at 200 meters from his position might load HEDP and set 200 meters on his quadrant sight. To prepare for an engagement in a wooded area where engagement ranges are extremely short, an antiarmor specialist might dismount with an AT4 instead of a Javelin.

d. **Trigger**. A trigger is a specific set of conditions that dictates initiation of fires. Often referred to as engagement criteria, a trigger specifies the circumstances in which subordinate elements are to engage. The circumstances can be based on a friendly or enemy event. For example, the trigger for a platoon to initiate engagement could be three or more enemy combat vehicles passing or crossing a given point or line. This line can be any natural or manmade linear feature, such as a road, ridgeline, or stream. It may also be a line perpendicular to the unit's orientation, delineated by one or more reference points.

e. **Weapons Control Status**. The three levels of weapons control status outline the conditions, based on target identification criteria, under which friendly elements may engage. The platoon leader sets and adjusts the weapons control status based on friendly and enemy disposition and the clarity of the situation. In general, the higher the probability of fratricide, the more restrictive the weapons control status. The three levels, in descending order of restriction, are—

- WEAPONS HOLD—Engage only if engaged or ordered to engage.
- WEAPONS TIGHT—Engage only targets that are positively identified as enemy.
- WEAPONS FREE—Engage any targets that are not positively identified as friendly.

As an example, the platoon leader may establish the weapons control status as WEAPONS HOLD when friendly forces are conducting a passage of lines. By maintaining situational awareness of his own elements and adjacent friendly forces, however, he may be able to lower the weapons control status. In such a case, the platoon leader may be able to set a WEAPONS FREE status when he knows there are no friendly elements in the vicinity of the engagement. This permits his elements to engage targets at extended ranges even though it is difficult to distinguish targets accurately at ranges beyond 2,000 meters under battlefield conditions. The platoon leader may also establish a different weapons control status for his elements based on situational awareness updates. Weapons control status is extremely important for forces using combat identification

systems. Establishing the weapons control status as WEAPONS FREE permits leaders to engage an unknown target when they fail to get a friendly response.

f. **Rules of Engagement**. ROE specify the circumstances and limitations under which forces may engage. They include definitions of combatant and noncombatant elements and prescribe the treatment of noncombatants. Factors influencing ROE are national command policy, the mission and commander's intent, platoon leader's intent, the operational environment, and the law of war. ROE always recognize a soldier's right of self-defense; at the same time, they clearly define circumstances in which he may fire.

g. **Engagement Techniques**. Engagement techniques are effects-oriented fire distribution measures. The most common engagement techniques in platoon operations are—

- Point fire.
- Area fire.
- Simultaneous (or "volley") fire.
- Alternating fire.
- Observed fire.
- Sequential fire.
- Time of suppression.
- Reconnaissance by fire.

(1) ***Point Fire***. Point fire entails concentrating the effects of a unit's fire against a specific, identified target such as a vehicle, machinegun bunker, or ATGM position. When leaders direct point fire, all the unit's weapons engage the target, firing until they destroy it or until the required time of suppression expires. Employing converging fires from dispersed positions makes point fire more effective because the target is engaged from multiple directions. The unit may initiate an engagement using point fire against the most dangerous threat, then revert to area fire against other, less threatening point targets.

(2) ***Area Fire***. Area fire involves distributing the effects of a unit's fire over an area in which enemy positions are numerous or are not obvious. If the area is large, leaders assign sectors of fire to subordinate elements using a terrain-based distribution method such as the quadrant technique. Typically, the primary purpose of area fire is suppression; however, sustaining effective suppression requires judicious control of the rate of fire.

(3) ***Simultaneous Fire***. Units employ simultaneous (or "volley") fire to rapidly mass the effects of their fires or to gain fire superiority. For example, a unit may initiate a support-by-fire operation with simultaneous fire then revert to alternating or sequential fire to maintain suppression. Simultaneous fire is also employed to negate the low probability of hit and kill of certain antiarmor weapons. As an example, a rifle squad may employ simultaneous fire with its AT4s to ensure rapid destruction of a BMP that is engaging a friendly position.

(4) ***Alternating Fire***. In alternating fire, pairs of elements continuously engage the same point or area targets one at a time. For example, an infantry platoon may alternate the fires of a pair of machineguns or a vehicle section between vehicles. Alternating fire permits the unit to maintain suppression for a longer duration than does volley fire. It also forces the enemy to acquire and engage alternating points of fire.

(5) ***Observed Fire***. Observed fire allows for mutual observation and assistance while protecting the location of the observing element and conserving ammunition. The

company commander may employ observed fire between elements in the company. He may direct one platoon to observe while another platoon engages the enemy. The platoon may use observed fire when it is in protected defensive positions with engagement ranges more than 800 meters. For example, the platoon leader may direct the mounted element to engage the enemy while the infantry squads and weapons squad observe the effects of the fires. The observing elements prepare to engage the enemy on order in case the mounted element fails to effectively engage the enemy, has malfunctions, or runs low on ammunition.

(6) ***Sequential Fire***. In sequential fire, the subordinate elements of a unit engage the same point or area target one after another in an arranged sequence. For example, a platoon may sequence the fires of its four BFVs to gain maximum time of suppression. Sequential fire can also help prevent the waste of ammunition, as when rifle squads wait to see the effects of the first Javelin before firing another. Additionally, sequential fire permits elements that have already fired to pass on information they have learned from the engagement. For example, an infantryman who missed a BMP with AT4 fires could pass range and lead information to the next soldier preparing to engage the BMP with an AT4.

(7) ***Time of Suppression***. Time of suppression is the period, specified by the platoon leader, during which an enemy position or force must be suppressed. Suppression time is typically dependent on the time it will take a supported element to maneuver. Normally, a unit suppresses an enemy position using the sustained rate of fire of its automatic weapons. In planning for sustained suppression, leaders must consider several factors: the estimated time of suppression, the size of the area being suppressed, the type of enemy force to be suppressed, range to the target, rates of fire, and available ammunition quantities.

(8) ***Reconnaissance by Fire***. Reconnaissance by fire is the process of engaging possible enemy locations to elicit a tactical response, such as return fire or movement. This response permits the platoon leader and subordinate leaders to make accurate target acquisition and then to mass fires against the enemy element. Typically, the platoon leader directs a subordinate element to conduct the reconnaissance by fire. For example, he may direct an overwatching section to conduct the reconnaissance by fire against a probable enemy position before initiating movement by the bounding section.